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Casualties in Mining.

R. M. HASELTINE.

READ AT COLUMBUS MEETING.

[Mr. Haseltine: Mr. President, and gentlemen of the Institute: I want to say, by way of introduction, that this paper is not properly a paper before the Institute. It is a part of my annual report, and I intended, had I time, to assort from it certain sections which would make, perhaps, something that would be of interest, or a suitable matter of discussion for the Institute; but owing to other duties and want of time, I have not been able to do so, and in order to bring it before you perhaps I may have to read the major part of it and take up your time more than I desire, and perhaps, in that connection, read some portions of it that may be of minor interest to you. I want to say still further, that another portion of the report which I expected to discuss at some length, has not been revised, and I have not got it here, and, if you desire, I will state the main features of it after I have bored you as long as you care to be by this paper. The title of the paper is, "The Casualties of 1888."]

I am pleased to report that the wave of mining calamities which has visited our sister States during the past year, has escaped us. The reports just in, indicate that nothing out of the usual line of accidents has occurred during the year. I have thought it best to deviate from the well-worn path of my predecessors and chronicle all accidents that are reported, as provided in section 293 of the mining law. These I have divided into three classes, which I designate as fatal, serious, and minor. Under the head of fatal accidents are placed those in which death is instantaneous, or occurs during the year, as a result of said injury. Under serious accidents I place all injuries which result in a broken bone, or a crush of such a character as to remain a permanent injury. Under minor, all bruises, sprains, cuts, and all accidents which do not result in fracturing a bone. The returns just in show that 238 accidents occurred during the year, of which twenty-nine resulted fatally, seventy-eight were seriously injured, and 131 were of a minor character. I am inclined to think this list is

correct, as the marked desire of the operators in the State to comply with the provisions of the mining law, and the increased force of the department, render it almost impossible for an accident to escape the notice of the department. This, certainly, is a very creditable showing as compared with the year 1887, in which the product of coal exceeded that of any preceding year, the report of which places the fatalities at thirty-six, and those of a serious character at seventy-five. With the exception of two or three instances, these occurred in mines employing more than ten men, which the report places at 399. This number continued until the 1st of May, when the amendment to the mining law placed all the mines under the department. The reports show that, since that time, there have been in the State 429 coal mines employing more than ten men, and 353 mines which employ a less number of men; sixty-two mines that produce fire clay, and fifty-one mines producing iron ore, making a total of 895 mines from which accidents are reported. Although the number of mines under inspection has been more than doubled, there has been a decrease of seven in the fatalities, and the increase of serious accidents has been but three. This, certainly, is a gratifying result for the year, which has been one of exceptional prosperity to the coal trade.

The following table shows the casualties—fatal, serious and minor—as divided among the counties in which they occurred.

Counties.	Fatal	Serious ..	Minor	Totals
Athenś.....	2	9	14	25
Belmont.....	3	5	8	16
Columbiana.....	0	3	6	9
Coshocton.....	0	0	4	4
Carroll.....	1	7	9	17
Guernsey.....	2	3	2	7
Gallia.....	1	0	0	1
Hocking.....	0	4	7	11
Jackson.....	2	13	7	22
Jefferson.....	1	1	4	6
Lawrence.....	0	1	0	1
Medina.....	1	2	1	4
Meigs.....	1	2	6	9
Mahoning.....	0	0	2	2
Muskingum.....	1	1	0	2
Noble.....	0	0	0	0
Perry.....	4	9	10	23
Portage.....	0	0	1	1
Summit.....	0	0	2	2
Stark.....	7	10	26	43
Tuscarawas.....	2	5	13	20
Trumbull.....	0	4	3	7
Vinton.....	1	0	1	2
Wayne.....	0	0	4	4
Washington.....	0	0	0	0
Totals.....	29	79	130	238

It will be noticed that Stark county leads the list in the fatal accidents in the State, the fatalities being nearly double that of any other county; in serious accidents it is second to Jackson; while in minor accidents, it resumes its position of nearly double that of any other of the counties, and equals eighteen per cent. of the entire number of accidents in the State. Returning to the lists of fatal and serious accidents in order to form a comparison with former reports, it will be seen that it drops below that of the two preceding years; in 1886, it was sixteen and six-tenths per cent., in 1887, it was twenty and seven-tenths per cent., while in 1888, sixteen and one-half per cent.; had I followed the foot-steps of my predecessors, the difference would

have been more favorable as compared with former years. Closely following in the list are Athens, Perry, Jackson and Tuscarawas, all of which have had twenty and not exceeding twenty-five casualties of all classes during the year.

Below is given a table showing the causes of the casualties enumerated above, the most prominent being the falls of roof and coal, which furnishes nearly two-thirds, or sixty-one and three-fourths per cent. of the entire number. By referring to previous reports of this department, it will be seen that the reports of 1884, 1885 and 1886, place the proportion at nearly or quite one-half, while in 1887, it is placed at two-thirds, but in reality was seventy-two per cent., while during this year the number is alarmingly great, notwithstanding the fact that a large percentage are of a minor character, it still is an improvement of ten and one-fourth per cent. over last year. It is believed to be largely the result of carelessness on the part of the miner, and I will discuss it at greater length further on.

Cause of the accidents from November 15, 1887, to November 15, 1888.	Deaths.....	Accidents..
Falls of roof.....	15	31
Falls of coal.....	5	20
Injured by the cars.....	1	2
Premature discharge.....	2	4
Falls outside.....	0	2
Explosions of gas.....	1	1
Caught under cage.....	3	2
Kicked by mule.....	1	1
No cause given.....	0	3
Miscellaneous.....	1	2
Totals.....	29	78

A detailed list of all accidents and deaths in and about the mines of the State during the year is as follows:

FATAL ACCIDENTS.

1887.

November 26. William Haines, at Rock Hill mine, Belmont county; killed by being run over by bank cars.

December 1. Gideon Renwick, at Monarch mine, Tuscarawas county; killed by an explosion of a shot which had hung fire.

December 19. Peter Krapus, at Trail Run mine, Guernsey county; killed by an explosion of gas.

December 30. Richard Jones, at Barnard's mine, Belmont county; injured by a fall of coal and died January 9, 1888.

1888.

January 25. Thomas Easterling, at Price mine, Jackson county; killed by a fall of slate.

February 7. David Robbins, at Riverside mine, Jefferson county; killed by a fall of slate.

February 27. Elias Thomas, at Fitz Allen mine, Carroll county; killed by a fall of rock.

March 1. William Yeager, at Carl mine, Gallia county; killed by flying debris from an explosion of shot in an adjoining room.

March 20. Edward Ward, at Nicholson mine, Guernsey county; killed by a fall of coal.

March 28. Martin Hayes, at Brier Hill mine, Athens county; injured by a fall of coal and died on March 31.

April 9. Robert Archibald, at C. & H. C. & I. Co.'s mine No. 9, Perry county; killed by falling stone.

May 23. Reese Jones, at XX mine, Perry county; killed by a fall of coal.

May 28. George Weaver, at Excelsior Slope, Medina county; killed by a fall of stone.

May 15. Luther Berain, at West Massillon mine No. 2, Stark county; injured by the cage and died June 7th.

July 24. Thomas Thoborn, at Co-operative mine, Perry county; killed by a fall of coal.

July 30. Peter J. Seal, at C. & H. C. & I. Co. ore mine, Vinton county; killed by a fall of slate.

July 31. William Archibald, at C. & H. C. & I. Co. mine No. 3, Perry county; killed by a fall of coal.

August 3. J. M. Rice, at New Pittsburgh mine, Athens county; killed by a fall of slate and coal.

August 27. Robert Lindsay, at Shisler mine, Stark county; killed by a falling timber which was being lowered to him to be used as a guide in the shaft.

September 14. Joseph Thomas, at Shisler mine, Stark county; killed by a fall of slate.

September 22. Alfred Parrish, at Shisler mine, Stark county; killed by the cage striking him while looking down the shaft. He was a laborer on the railroad.

September 24. Robert Nicholson, at Wheeling Creek No. 1 mine, Belmont county; killed by a fall of stone.

September 25. John Halter, at Hern Brook mine, Stark county; killed under the cage in hoisting shaft.

October 5. Paul Berdine, at Camp mine, Stark county; killed by a fall of rock.

October 9. Richard Crank, at Barnhill mine, Tuscarawas county; killed by a fall of roof.

November 2. Thomas Hopper, at Neff mine, Muskingum county; killed by a fall of roof.

November 9. Henry Harris, at Youngstown mine, Stark county; injured by a fall of roof, and died on the 10th.

November 10. Benjamin Otis Rider, at Center Valley mine, Jackson county; killed by the kick of a mule.

November 13. David C. Lewis, at Diamond mine, Meigs county; killed by a fall of slate.

SERIOUS ACCIDENTS.

1887.

November 22. Robert Sholto, at Garfield mine, Jackson county; leg broken by a fall of slate.

November 22. John Clouse, at Pewee mine, Perry county; leg crushed by a fall of coal.

November 30. David McPherson, at Slope mine, Columbiana county; leg broken by a fall of slate.

December 1. John Hughes, at Shawnee Valley mine, Perry county; leg broken by a fall of coal.

December 7. Howell Williams, at Youngstown mine, Stark county; leg broken; no cause given.

December 7. James Jones, at John Henry mine, Mahoning county; collar bone broken by falling from tippie.

December 13. G. W. Hamilton, at Coe Hill mine, Athens county; leg broken by cars.

December 15. John James, at Furnace mine, Perry county; leg broken by a fall of coal.

December 16. Joseph Wilkinson, at Orange mine, Carroll county; leg broken by a fall of coal.

December 29. William White, at Union mine, Perry county; ankle fractured by a fall of slate.

1888.

January 5. David Elias, at Lawrence mine, Lawrence county; collar bone broken by a fall of slate.

January 6. Peter Folmer, at C. & H. C. & I. Co.'s No. 19 mine, Hocking county; collar bone broken by being caught by the cars.

January 9. E. Gifford, at Tropic mine, Jackson county; leg broken by a fall of slate.

January 9. William Mead, at Fluhart's mine, Jackson county; three ribs broken, caught by a descending cage.

January 18. John Marshall, at Wheeling Creek mine No. 1 Belmont county; hip crushed by a fall of soapstone.

January 19. George Cochran, at Manly mine, Perry county; leg broken by a fall of coal.

January 23. George White, at Scheck's mine, Belmont county; leg broken by a fall of coal.

January 26. A. D. Walters, at Fluhart's mine, Jackson county; two ribs broken by a fall of slate.

February 4. Evan Hughes, at Keystone mine, Jackson county; injured by explosion of powder.

February 5. William Campbell, at Jefferson mine No. 1, Jefferson county; wrist broken by the cars.

February 8. John Gregory, at Ada mine, Jackson county; collar bone broken by a fall of slate.

February 10. George Mitchell, at Snake Hollow mine, Hocking county; toes cut off by a fall of rock.

February 14. Robert Armbruster, at Osnaburgh mine, Stark county; leg broken by a fall of slate.

February 16. Charles Watkins, at Slope mine, Columbiana county; leg broken by bank cars.

February 22. Charles Pierce, at Sunday Creek mine No. 7, Perry county; leg broken by a fall of coal.

February 27. Daniel and David Morgan, at Hasson mine, Trumbull county; badly burned by an explosion of gas, while in the mine, with no business there.

March 21. George Little, at West Willow Spring mine, Stark county; collar bone broken by car.

April 3. Spencer Davis, at Globe mine, Jackson county; head injured by fall of slate.

April 4. Frank Bodner, at C. & H. C. & I. Company mine No. 25, Athens county; leg broken and body bruised by a fall of slate.

April 9. William Whitecar, at Ada mine, Jackson county; collar bone cracked, no cause given.

April 10. J. G. Jenkins, at Fitz Allen mine, Carroll county; leg broken and head cut by a fall of rock.

April 10. Robert Frazier, at Glen Eben mine, Athens county; leg broken by a fall of slate.

April 13. Homer Fisher, at Hipples mine, Jackson county; arm broken by a fall of slate.

April 20. Charles Schindler, at Mineral Ridge mine, Tuscarawas county; leg broken by being caught by the cars.

April 25. Huber Mustard, at Elm Run mine, Stark county; leg broken by fall of coal, while working off a shot.

April 26. John Fisenshoe, at Camp mine, Stark county; ribs broken by a fall of slate.

April 27. Evert Campton, at Nicholson mine, Guernsey county; leg broken by a fall of slate.

April 28. Peter Allen, at Nicholson mine, Guernsey county; arms and back severely injured by a fall of coal.

April 30. Leon Lemoin, at Jacksonville mine No. 4, Athens county; shoulder blade broken by a fall of roof.

May 16. Martin Stair, at Peacock mine, Meigs county; arm broken by the kick of a mule.

May 17. Edwin Hughes, at Somerdale mine, Tuscarawas county; foot crushed by a fall of coal.

May 22. David Phillips, at Franklin mine, Jackson county; thigh bone broken by a fall of slate.

May 22. Hugh Wilson, at South Side mine, Tuscarawas county; wrist bone broken and ankle sprained by fall of roof.

June 4. Evan Williams, at Grace mine, Jackson county; leg broken by being caught between cars.

June 30. James McCune, at Globe mine, Jackson county; leg, arm and rib broken by fall of draw slate.

July 9. Evan Reese, at Briar Ridge mine, Athens county; leg broken by falling under car.

July 10. Michael Gaughan, at Leetonia mine, Columbiana county; right arm crushed by falling between cars; afterward amputated.

July 14. Archie F. Jones, at Pittsburgh mine, Belmont county; leg broken by the car.

July 25. James Huffman, at Card mine, Medina county; collar bone broken by fall of coal.

July 25. Joseph Grater, at Beaver Run mine, Stark county; leg and two ribs broken by a fall of roof.

July 28. John Morgan, at Sunday Creek mine No. 10, Athens county; leg broken, and otherwise bruised by car falling on him.

July 31. Henry Green, at Happy Hollow mine, Athens county; arm broken and sight destroyed by a premature blast of powder.

August 18. Milton Burley, at Eliza mine, Jackson county; hip broken and nose crushed by a fall of slate.

August 27. Thomas Heath, at Diamond mine, Medina county; leg broken by a fall of coal.

September 6. John Rook, at Fitz Allen mine, Carroll county; side and legs bruised by a fall of coal.

September 7. George Holmes, at Brock Hill mine, Tuscarawas county; leg broken and body bruised by a fall of stone.

September 12. Patrick Shea, at Fitz Allen mine, Carroll county; foot crushed by a fall of coal.

September 13. John Tuck, same mine; leg broken in two places by fall of rock.

September 14. Frank Hamilton, at No. 31 mine, Athens county; foot crushed between draw heads of railroad cars.

September 16. Samuel Offholder, at Prospect mine, Tuscarawas county; three ribs broken by car falling over the tippie.

September 18. James Brandt, at Hern Brook mine, Stark county; leg broken while bearing-in coal.

September 18. Morgan Griffith, at Shawnee Valley mine, Perry county; right hand crushed while coupling cars; afterward amputated above the wrist.

September 20. Henry F. Bartels, at Syracuse shaft, Meigs county; back injured by fall of draw slate.

September 21. John Hicks, at Hidd's mine No. 12, Belmont county; leg broken by fall of slate.

September 24. Charles Hemming, at Fitz Allen mine, Carroll county; foot crushed by a fall of coal.

September 24. Elias Williams, at Robinson mine, Belmont county; hip bruised and two toes broken by fall of slate.

September 28. John Fluehart, at Ironpoint mine, Perry county; back injured and ribs broken while driving in the mine.

October 3. Robert Russell, at C. & H. C. & I. mine No. 25, Athens county; eyes blown out and breast bruised by premature discharge.

October 5. Jacob Weaver, at Hasson mine, Trumbull county; collar bone fractured by a fall of coal.

October 5. Andrew Legore, at Raccoon mine, Hocking county; leg broken while trying to get on a moving train.

October 11. Charles Slates, at Fitz Allen mine, Carroll county; leg broken by fall of rock.

October 22. Casper Rominsky, at Brush Fork No. 2. mine, Hocking county; eyes injured by a premature discharge of powder.

October 31. Frank Barkheimer, at Salt Run mine, Muskingum county; two ribs broken by fall of coal.

November 12. Casper Goetz, at Minglewood mine, Stark county; finger cut off by a fall of slate.

November 13. Rudolph Bowman, at Hern Brook mine, Stark county; leg broken by fall of coal.

November 14. George Hodges, at Trail Run mine, Guernsey county; leg broken by fall of slate.

November 14. John Burke, at Beaver Run mine, Stark county; foot bruised by fall of slate, which necessitated the amputation of two toes.

November 15. Henry Millercamp, at C. & H. C. & I. Company mine No. 3, Perry county; hip broken by being run over by the cars.

MINOR ACCIDENTS.

Minor accidents during the year beginning November 16, 1887, and ending November 15, 1888:

November 18. Jacob Overall, at Raccoon mine, Hocking county; bruised by a fall of slate.

November 18. William Jones, at Summit mine, Summit county; leg cut by a fall of coal.

November 18. Jacob Thorn, at Manning mine, Mahoning county; bruised by a fall of coal.

November 22. James Stevenson, at New Hazelton mine No. 2, Carroll county; back hurt by a fall of slate.

November 23. Lewis and Samuel Jones, at Clinton mine, Wayne county; arms burned by a premature blast.

November 28. John Hickley, at Baltimore mine, Guernsey county; foot and ankle badly bruised by a fall of coal.

November 30. R. A. Holdcroft and Paul Atkinson, at Federal Creek mine No. 2, Athens county; bruised about the hips and shoulders by a fall of roof.

December 3. William Powell, at Upson mine, Perry county; injured by an explosion of powder.

December 5. Amiel Wagler, at Osborne mine No. 1, Carroll county; hand badly crushed by the cars.

December 6. Josiah Bool, at Pigeon Run mine, Stark county; slightly injured in the back by a fall of coal.

December 7. Charles Slack, at Kessinger mine, Jackson county; back and ankle sprained by a fall of draw slate.

December 8. John Griffiths, at Camp mine, Stark county; back bruised by a fall of slate.

December 12. Charles Ellig, at Hays mine, Columbiana county; slightly injured by a fall of draw slate.

December 13. William Holt, at Leetonia mine, Columbiana county; leg hurt by cars while dumping.

December 16. Oley Pierson, at Monday mine No. 3, Hocking county; slightly injured by a fall of coal.

December 19. Levi Abbott, at Union mine, Athens county; finger cut off by catching it in the cars.

December 19. W. H. Tither, at Trail Run mine, Guernsey county; slightly burned by an explosion of gas.

December 26. James Jenkins, at Captina mine, Belmont county; hand bruised by a fall of slate.

December 29. William White, at Union mine, Perry county; ankle fractured by a fall of draw slate.

December 31. James Halbert, at No. 19 mine, Hocking county; leg bruised between cars and post.

January 2. Samuel Norton, State Line mine, Columbiana county; finger mashed between car and rib.

January 5. Benjamin Fennel, at Franklin mine, Belmont county; back and ankle sprained by a fall of slate.

January 9. Jacob Keyster, at Belmont mine, Belmont county; caught between cars and rib, leg cut and side badly bruised.

January 10. William F. Casebeer, at Pike Run mine, Tuscarawas county; back severely injured by a fall of rock.

January 12. Samuel McFearn, at Elm Run mine, Stark county; head and face bruised by a fall of rock.

January 17. William Harrison, at Fitz Allen mine, Carroll county; pick run into his leg.

January 18. John Marshall, at Wheeling Creek mine No. 1, Belmont county; hips crushed by a fall of soapstone.

January 18. John Anderson, at Minglewood mine, Stark county; back hurt by a fall of slate.

January 19. John Nowman, at Fitz Allen mine, Carroll county; hand mashed by car.

January 19. John Kistler, at XX mine, Perry county; face hurt by a fall of slate.

January 24. Henry Gillord, at Hern Brook mine, Stark county; injured by a shot.

January 27. James Ogle, at Black Diamond mine, Hocking county; leg bruised by the car.

February 1. Frank Barkheimer, at Youngstown mine, Stark county; back injured by a fall of slate.

February 4. Evan Hughes, at Keystone mine, Jackson county; injured by an explosion of powder.

February 5. Robert Allen, at Morgan Run mine, Coshocton county; ankle sprained by car jumping the track.

February 6. August Schindler, at State Line mine, Columbiana county; injured by a fall of slate.

February 6. John Kaufmann, at Osnaburgh mine, Stark county; finger broken between car and rib.

February 7. Alexander Worthington, at Furnace mine No. 2, Perry county; collar bone dislocated by an unknown cause.

February 13. Ebenezer Jenkins, at Youngstown mine, Stark county; back slightly injured by a fall of slate.

February 15. James T. Davis, at Marshall mine, Trumbull county; injured by a fall of coal.

February 20. Charles Barnes, at Rock Hill mine, Belmont county; foot bruised between cars.

February 23. John L. Jackson, at Morgan Run mine, Coshocton county; leg injured by a fall of slate.

February 23. Ed. Newport, at Newport Mine, Jackson county; head cut and foot crushed by fall of slate.

February 27. Daniel Ahem, at Chestnut Grove mine, Stark county; piece of dirt flew in his eyes, which caused him to lose his sight.

March 1. John Thomas, at Orange mine, Carroll county; back and legs hurt by a fall of slate.

March 2. John Price, at Tod mine, Trumbull county; injured by cage striking him.

March 5. John Butler, at Federal Creek mine No. 2, Athens county; foot crushed by a fall of slate.

March 5. John Memer, at Jefferson mine No. 1, Jefferson county; thigh crushed by a fall of coal.

March 7. Levi Doran, at Wade mine, Stark county; back and shoulders slightly bruised by a fall of slate.

March 10. Lawrence Mosbaugh, at Pigeon Run mine, Stark county; leg slightly injured by a fall of slate.

March 14. Fred Barrett, at Thoroughfare mine, Hocking county; hips bruised by a fall of coal.

March 15. John Barcus, at Slope mine, Columbiana county; sprained ankle; cause not stated.

March 17. Henry Crawford, at Wade mine, Stark county; back and leg slightly bruised by a fall of slate.

March 17. John Brown, at Minglewood mine, Stark county; badly squeezed between roof and top of car.

March 22. William Whitegar, at Ada mine, Jackson county; collar bone injured by a fall of slate.

March 28. Elmer Strawn, at Pioneer mine, Tuscarawas county; ankle sprained between two cars.

April 1. John Blany, at Shawnee mine, Perry county; shoulder slightly injured by a fall of draw slate.

April 8. William G. Williams, at Jacksonville, mine No. 4, Athens county; injured slightly by being caught by the machinery.

April 9. John T. Williams, at Tod mine, Trumbull county; bruised across the back and on various parts of the body.

April 23. David Jones, at Minglewood mine, Stark county; foot injured by a fall of slate.

April 28. Nelson Perkins, at Broadwell mine, Athens county; leg bruised by a fall of slate.

April 28. Peter Allan, at Elm Run mine, Stark county; back bruised by a fall of coal.

May 5. Joel Koon, at Maple Hill mine, Athens county; badly bruised by a fall of coal.

May 15. Godfrey Kaserman, at Walton Ridge mine, Tuscarawas county; slightly bruised by a fall of rock.

May 17. Edwin Hughes, at Somerdale mine No. 2, Tuscarawas county; foot crushed by a fall of coal.

May 18. Doc. Bickel, at Peacock mine, Meigs county; foot slightly injured by a fall of slate.

May 29. John Greaser, at Peacock mine, Meigs county; back slightly injured by a fall of slate.

June 5. Sherman Russell, at Furnace mine, Perry county; bruised by a fall of bottom coal.

June 6. Sylvester Kendall, at Robinson mine, Belmont county; back and hip hurt by a fall of soapstone.

June 7. Frank Arthur, at Raccoon mine, Hocking county; slightly bruised by a fall of slate.

June 19. William Baker, at New Pittsburgh mine, Athens county; hips crushed by a fall of slate.

June 19. Charles Estep, at Williams mine, Meigs county; slightly injured by a fall of coal and slate.

June 23. Charles Simons, at Happy Hollow mine, Athens county; slightly injured by falling off of car.

June 26. John Duke, at Robinson mine, Belmont county; slightly injured by a fall of soapstone.

June 26. John Doubleddee, at Card mine, Medina county; back and hips bruised by a fall of slate.

June 28. John Inson, at Black Diamond mine, Hocking county; back sprained by a fall of top coal.

June 29. Scott Wood, at Morgan Run mine, Coshocton county; finger crushed between cars.

June 30. Peter Meismer, at Hern Brook mine, Stark county; back injured by the cage.

July 6. David Bowlands, at Sippo mine, Stark county; slightly bruised by a fall of slate.

July 6. Daniel Nolan, at Mineral Ridge mine, Tuscarawas county; thumb broken and breast burned by an explosion of powder.

July 8. William Renner, at Ridgway Ore mine, Tuscarawas county; face and arm burned by an explosion of powder.

July 8. Lewis Lewis, at Dalton mine, Wayne county; foot crushed by a fall of slate.

July 9. John Llewellyn, at Brownlee mine, Mahoning county; injured by fall of stone.

July 17. S. Huffman, at Turner mine No. 5, Tuscarawas county; injured internally by car falling through the tippie.

July 18. John Stoltz, at Elm Run mine, Stark county; shoulder bruised by falling from cage to bottom of shaft.

July 19. William Hevelon, at South Side mine, Tuscarawas county; ankle bruised by the car.

July 24. R. A. Tilton, at Walnut Hill mine, Jefferson county; head cut by a fall of stone.

July 27. Loraine Leroy, at Sunday Creek mine No. 7, Perry county; badly bruised by riding on loaded car.

July 27. Daniel Hines, at Monarch mine, Tuscarawas county; ankle shattered by a piece of coal from a blast.

July 30. Robert See, at Hamley Run mine, Athens county; hand crushed by the cage.

August 6. John Roberts, at Diamond mine, Portage county; back injured by the cage.

August 7. Lewis Naney, at Coe Hill mine, Athens county; ankle crushed by a fall of coal.

August 14. John Allen, at Elm Run mine, Stark county; back and shoulder bruised by a fall of coal.

August 14. George Korns, at Walton Ridge mine, Tuscarawas county; head and shoulders bruised by the car.

August 20. Ed Swisher, at Cleveland mine, Stark county; hand squeezed by car and roofing, finger also crushed.

August 22. Charles Siffon, at Pigeon Run mine, Stark county; hand and shoulder badly hurt by a fall of coal.

August 23. John Richardson, at Somerdale mine No. 2, Tuscarawas county; back and spine injured by a fall of slate.

August 29. Ab Williams, at Newport mine, Jackson county; leg crushed at knee between cars and post.

August 29. Watkin Williams, at Minglewood mine, Stark county; finger crushed between the car and rib.

September 5. Mordecai Taylor, at Beech Grove mine, Perry county; slightly injured by a fall of rock.

September 6. Harvey Ross, at Sedalia mine, Athens county; side injured by a piece of brick from a boiler explosion.

September 6. John Rook, at Fitz Allen mine, Carroll county; side and legs bruised by a fall of coal.

September 6. James Harris, at Summit Bank, Summit county; cut in head and under arm by fall of slate.

September 10. Joseph Wolf, at Tuscarawas Ore mine, Tuscarawas county; head hurt by a piece of falling ore.

September 12. Patrick Shea, at Fitz Allen mine, Carroll county; foot crushed by a fall of coal.

September 14. Frank Hamilton, at No. 31 mine, Athens county; foot crushed by slipping between draw bars.

September 14. William Rudolph, at Fluhart mine No. 1, Jackson county; injured by a fall of slate.

September 15. William Roden, at Ruth mine, Wayne county; back injured by a fall of slate.

September 15. Andrew Smith, same mine, leg injured by car.

September 17. Jorden Chapman, at Lucy mine, Jackson county; face cut and bruised by a shot from an adjoining room.

September 17. Dock Lear, at Union mine, Perry county; head and hands bruised by a fall of slate.

September 19. William Ditmer, at Blaine and Logan mine, Stark county; slightly injured by a fall of coal.

September 20. Henry F. Bartels, at Syracuse mine, Meigs county; back wrenched by a piece of draw slate falling on him.

September 22. George Parkin, at Brilliant mine, Jefferson county; leg bruised by the car.

September 24. Hiram Waley, at King's mine, Athens county; head, shoulder and right arm bruised by fall of slate.

September 24. Elias Williams, at Robinson's mine, Belmont county; hip bruised and two toes broken by fall of slate.

September 24. Charles Heming, at Fitz Allen mine, Carroll county; foot crushed by a fall of coal.

September 28. John Fluehart, at Ironpoint mine, Perry county; back crushed between cars and rib.

October 2. John Muskala, at West Massillon mine No. 2, Stark county; back bruised by car.

October 3. James T. Hayes, at No. 4 mine, Vinton county; back bruised by fall of slate.

October 5. William Jones, at Brilliant mine, Jefferson county; split his knee with an ax while putting up a post.

October 6. Thomas Dalton, at Syracuse mine, Meigs county; knee dislocated by catching his foot on a tie.

October 29. William C. Williams, at Syracuse mine, Meigs county; back and hip bruised by being squeezed between car and roof.

November 1. David Perry, at Franklin mine No. 2, Co-shocton county; back and head injured by a fall of rock.

November 9. George Griduiski, at Beaver Run mine, Stark county; cheek cut and body slightly bruised by fall of slate.

November 15. Con O'Donnell, at Slope mine, Columbiana county; shoulder bruised by car.

It being the province of this department to use all efforts to protect the lives and health of those engaged in our mines the question as to how to obviate a further increase, and if possible reduce the proportion of accidents, as the number of mines and miners increase in the State, is one of serious moment. It is believed that sixty-six per cent. of them is the result of negligence on the part of the miner in not securely propping his room. I am supported in this belief by a careful analysis of the accidents that occurred during the past year, as the first table giving the list of accidents shows that fifty-nine, or twenty-four and eight-tenths per cent. of them occurred on Monday, being twenty in excess of the average of the footing under each day of the week during this year, which it will be seen was thirty-nine.

Below will be found a table giving the list by counties.

Counties.	Fatal.....	Serious	Minor	Total	Monday.....	Tuesday	Wednesday...	Thursday	Friday.....	Saturday.....	Total.....
Athens.....	2	9	14	25	8	5	4	1	3	4	25
Belmont	3	5	8	16	7	1	3	1	2	2	16
Columbiana	0	3	6	9	3	2	1	3	0	0	9
Coshocton	0	0	4	4	1	0	0	2	1	0	4
Carroll.....	1	7	9	17	4	3	2	7	1	0	17
Guernsey.....	2	3	2	7	3	1	1	0	1	1	7
Gallia.....	1	0	0	1	0	0	0	0	1	0	1
Hocking	0	4	7	11	1	0	1	2	6	1	11
Jackson.....	2	13	7	22	5	3	4	3	3	4	22
Jefferson	1	1	4	6	2	2	0	0	1	1	6
Lawrence	0	1	0	1	0	0	0	1	0	0	1
Medina.....	1	2	1	4	2	1	1	0	0	0	4
Meigs	1	2	6	9	1	4	1	2	1	0	9
Mahoning	0	0	2	2	1	0	0	0	1	0	2
Muskingum	1	1	0	2	0	0	1	0	1	0	2
Noble.....	0	0	0	0	0	0	0	0	0	0	0
Perry	4	9	10	23	4	5	4	6	3	1	23
Portage.....	0	0	1	1	1	0	0	0	0	0	1
Summit.....	0	0	2	2	0	0	0	1	1	0	2
Stark	7	10	26	43	8	9	12	3	4	7	43
Tuscarawas.....	2	5	13	20	3	5	1	5	4	2	20
Trumbull	0	4	3	7	3	0	2	0	2	0	7
Vinton	1	0	1	2	1	0	1	0	0	0	2
Wayne.....	0	0	4	4	1	0	1	0	0	2	4
Washington	0	0	0	0	0	0	0	0	0	0	0
Totals	29	79	130	238	59	41	40	37	36	25	238

From a careful analysis of the above table I was led to make further comparisons in this direction. In order to better illustrate the exact proportion of accidents occurring to miners from want of care in properly securing themselves I have prepared a table showing the cause of the accident and the day of the week on which it occurred.

Cause of the accident from November 15, 1887, to Novem- ber 15, 1888.	Monday ...	Tuesday ...	Wednesday	Thursday ..	Friday	Saturday....	Total
Falls of roof.....	20	19	19	20	14	8	100 $42\frac{2}{10}\%$
Falls of coal	10	9	11	8	7	2	47 $19\frac{7}{10}\%$
Injured by cars.....	13	7	4	5	10	7	46
Premature discharge...	2	2	3	1	2	4	13
Falls outside.....	1	1	1	0	0	0	3
Explosions of gas.....	4	0	0	0	0	0	4
Caught under cage....	2	2	1	0	1	2	8
Kicked by mule.....	0	0	1	0	0	1	2
No cause given.....	2	1	1	1	0	0	5
Miscellaneous	5	0	0	2	2	1	10
Totals.....	59	41	40	37	36	25	238

From the above table it will be seen that forty-two per cent. of list was the result of falling roof, and nineteen and seven-tenths was caused by falling coal. The result of falls furnishing sixty-one and seven-tenths per cent. of the entire list of casualties during the year.

Cause of the ac- cident from No- vember 15, 1886, to November 15, 1887.	Monday	Tuesday	Wednesday...	Thursday	Friday	Saturday.....	Total
Fall of roof....	11	8	8	14	1	6	48 $42\frac{2}{10}\%$
Fall of coal ...	5	3	5	5	6	7	31
Fall of ore	0	0	0	1	0	0	1
Injured by cars.	3	3	4	0	2	4	16
Prem. explosion	3	1	1	1	1	0	7
Cr'hed u'd'r cage	1	0	2	1	0	0	4
Fall from tippie.	0	0	0	1	0	0	1
Inj'd by R. R. cars	1	0	0	0	0	0	1
Boiler explosion	1	0	0	0	0	0	1
Natural causes..	0	1	0	0	1	0	2
Total	25	16	20	23	11	17	112

} 71 $\frac{3}{10}\%$
} 28 $\frac{5}{10}\%$

It will be seen that during this year the fall of roof caused forty-eight and eight-tenths per cent. of the list, and the fall of coal was the cause of twenty-eight and five tenths per cent. of the entire list; seventy-one and three-tenths per cent. of this year's accidents can be charged up to these two causes.

Below will be found the table, which shows the casualties from November 15, 1885, to November 15, 1886.

Cause of the accident from November 15, 1885, to November 15, 1886.	Monday	Tuesday	Wednesday ..	Thursday	Friday	Saturday	Total
Fall of slate.....	10	6	8	6	7	15	52 $48\frac{1}{10}\%$
Fall of coal.....	6	4	3	3	2	4	22 $20\frac{3}{10}\%$
Premature explosion.	3	2	1	1	1	3	11
Boiler explosion....	0	0	0	0	0	2	2
Gas explosion.....	0	0	0	3	0	0	3
Injured by cars.....	2	2	2	2	0	3	11
Suffocation	0	0	0	1	0	0	1
Explosion air rec'r..	2	0	0	0	0	0	2
Falling down shaft..	1	0	0	0	0	0	1
Fall of ore.....	0	0	0	0	1	0	1
Natural causes.....	2	0	0	0	0	0	2
Miscellaneous	0	0	0	0	0	0	0
Totals.....	26	14	14	16	11	27	108

The result shows that forty-eight and one-tenth per cent. was caused by the fall of slate, and twenty and three-tenths per cent. from the fall of coal, and shows that sixty-eight and four-tenths per cent. of the entire list resulted from the two causes. The ratio this year is less than 1887, and greater than 1888.

Tables showing the cause of accidents from November 15, 1884 to November 15, 1885; also one from March 6, 1884 to November 15, 1884.

Cause of the accident from November 15, 1884, to November 15, 1885.	Monday	Tuesday	Wednesday...	Thursday	Friday	Saturday	Total
Fall of slate.....	10	6	5	1	4	8	34 $40\frac{3}{10}\%$
Fall of coal.....	3	1	3	2	3	4	16 $19\frac{3}{10}\%$
Injured by cars.....	2	6	5	3	1	3	20
Falling down shaft ..	1	1	2	0	0	0	4
Explosion powder...	3	0	0	0	1	0	4
Premature discharge.	2	0	2	0	0	0	4
Natural causes	0	0	0	0	1	0	1
Totals	21	14	17	6	10	15	83

Cause of the accident from March 6, 1884, to November 15, 1884.	Monday	Tuesday	Wednesday...	Thursday	Friday	Saturday	Total
Fall of slate.....	3	2	3	7	6	6	27 $40\frac{3}{10}\%$
Fall of coal.....	4	1	5	2	4	0	16 $23\frac{3}{10}\%$
Injured by cars.....	3	1	1	1	1	0	7
Fall down shaft.....	0	3	0	0	0	0	3
Premature explosion.	0	2	2	1	0	1	6
Natural causes	0	0	0	0	0	0	0
Explosions of gas...	1	0	0	3	4	0	8
Totals.	11	9	11	14	15	7	67

From the first table, it will be seen, forty and nine-tenths per cent. of the list was caused by the fall of slate, and nineteen and three-tenths per cent. by the fall of coal; this shows that sixty and two-tenths per cent. of the accidents of this year were attribu-

table to these two causes, which is an improvement in the percentages of other years.

The second table extends over a period of eight and one-half months, the result is remarkably close, when compared with the foregoing tables. Forty and three tenths per cent. being the result of falls of roof, and twenty-three and nine-tenths per cent. being the falling of coal, the percentage of the two combined is sixty-four and two-tenths per cent. of the entire number. Had the record been kept for the entire year, it is probable the result would not have been materially different. By a review of the foregoing tables, in the order which they are arranged, it will be seen that for the year 1888. the percentage of casualties was sixty-one and seven-tenths; 1887, it was seventy-one and three-tenths; 1886, it was sixty-eight and four-tenths; 1885, it was sixty and two-tenths; and for eight and one-half months of 1884, it was sixty-four and two-tenths; the average accidents resulting from falls of roof and coal for the entire four years, eight and one-half months being sixty-five and one-tenth per cent. The uniformity of this ratio is remarkably close, as in no instance does it vary from the general average more than six and two-tenths per cent. during this period of four years and eight and a half months, which embraces the record kept by the department. Two hundred and sixty-one, or forty-two and eight-tenths per cent. of the number were the victims of falling roof.

The fall of coal furnishes the cause of 132, or twenty-two and three-tenths per cent. of the entire number of casualties. Injuries sustained by the cars come next in order, and furnish sixteen and six-tenths per cent. of the list; the remaining eighteen and three-tenths per cent. is divided among the various causes enumerated in the tables.

It will be observed that in the foregoing tables the days of the week on which the accidents occurred, are given. From them it will be readily seen that the greatest number occurred on Monday, with two exceptions, when the greatest number occurred on Friday and Saturday respectively; the aggregate, however, still places Monday as the day for the greatest number of casualties.

On following page will be found a table beginning on March 6, 1884, and ending November 15, 1888:

	Monday	Tuesday.....	Wednesday...	Thursday	Friday	Saturday	Total
From Mar. 6, 1884 to Nov. 15, 1884.	11	9	11	14	15	7	67
" Nov. 15, 1884 to Nov. 15, 1885	21	14	17	6	10	15	83
" " 1885 to " 1886.	26	14	14	16	11	27	108
" " 1886 to " 1887.	25	16	20	23	11	17	112
" " 1887. to " 1888	59	41	40	37	36	25	238
Totals.....	142	94	102	96	83	91	608

From the above, it will be observed that during that period there occurred 608 accidents of all classes. Of these, 142 occurred on Monday, which is forty-one above the average, and equals twenty-three and one-third per cent. of the entire casualties for that period. The footing for the remaining days of the week vary but slightly above the average. The fact that Monday is the most unfortunate day of the week, is the result of the mine remaining idle over Sunday, thus allowing the roof to settle because of poorly set props, or from them being displaced by flying rock and coal from the blasts of powder which are discharged on suspending work. The freshly exposed roof and great masses of shattered coal remain suspended until the mine resumes again, when, in the confusion, some element of danger is overlooked until it is too late. It is impossible, from the reports, to ascertain the relative position the accidents on the remaining days of the week bore to the day of suspending work. It is believed, however, that many of the casualties that occur in the middle, or even latter part of the week, were on the first or second days the mine worked during that week. If this fact could be definitely ascertained, no doubt the ratio of accidents immediately following the resumption of work would be increased rather than diminished. To prosecute the inquiry further, I have taken the first and last two days of the month, also the two days preceding and two days following the 15th of the month, from the 15th of August, 1887, when the two weeks pay-bill went into effect, which I submit below.

Table opposite shows the accidents occurring on the first two and last two days of the month, and on the two days before and two days following the 15th, from August 15, 1887, which was the first pay-day after the two weeks' pay-bill went into effect.

thirteen occurred on the first two days and four on the last two days. During the fourth year five occurred on the first and fifteen on the last two days, and for the first nine months after the two weeks pay bill went into effect, the two preceding and two following the fifteenth furnished twelve accidents, and during the four and half months from July 1st to November 15th, 1888, three occurred on the first two and three on the last two, while on the two days preceding and the two following the fifteenth for that period there were twelve accidents. The result shows that during the four years and four and one half months, forty-four occurred on the first and forty-six on the last two days of the month, and that during the first fifteen months after the two weeks pay bill went into effect, that on the two days before and two days after the fifteenth of the month twenty-four accidents occurred.

In some portions of the State the coal is mined by "shooting off the solid," as it is termed among miners, which is the most dangerous mode of reclaiming coal in practice, except in the anthracite region. This system of mining has been adopted in several portions of the State, and is in general practice in that part of the Tuscarawas Valley extending from Akron to Beach City, and may account for a great many of the accidents that occur in this region. The miner drills a hole and charges it with an amount of powder, as in his judgment will be required to remove the amount of coal he has selected for his next days work, and after lighting the fuse retires for the day; if he has been mistaken in his judgment, or for want of skill over-loaded his hole with powder, the result is that it knocks out the props that have been set, and with the natural tendency of the powder to cut toward the roof the whole face of the room is shattered. A great objection to this system of mining is the encouragement it gives to unskilled labor in the mines. As soon as a man has learned to drill a hole in the best position to dislodge the coal, and tamp it properly, he is on an even footing with the old miner who has spent the best portion of his life in learning the trade of mining in a mechanical manner, and is entitled to be called a skilled mechanic. Should he attempt to mine his coal in a mechanical manner he at once gets into trouble, for his neighbor with only a few months experience and a supply of powder, by this barbarous system of mining, produces a greater amount of coal with much less labor than can be accomplished by properly dressing the coal; the old miner finds he cannot fill his turn, and is regarded as a poor miner by this class of his fellow workmen. Neither can he produce his coal as cheaply, the difference in time required to dress the coal is of greater value than the cost of the necessary amount of powder required to mine an equal amount of coal.

The competition in the coal trade is so great that the operator is compelled to produce his coal in the cheapest possible

manner, regardless of the dangerous practice of producing it or the wasteful method in which it is mined. This condition of affairs will continue as long as the coal trade is brisk, and the miner works on anxious to make all he can during the boom. During the rush in the morning in order to keep his turn of cars and before he has cleaned up his room or reset his props, that were displaced by the shot the night before, he frequently attacks a shattered mass of coal (known among miners as a standing shot) when by a few well directed blows of the pick he loosens the over hanging-mass so that in falling the projecting portions often strike him, and the result is a broken leg or, as it frequently occurs, brings with it a portion of roof that has been loosened by the shot, and the result is an accident the first thing in the morning. The ease with which this system of mining furnishes the miner with a supply of ready coal, and the fact that the system is easily learned, has made it exceedingly popular among miners in some sections of the State. But the result is that it fills those mines with unskilled miners and throws out of employment those who, by long years of experience and hard work, have perfected themselves in their trade and become skilled mechanics, which also gives this department a greater amount of anxiety and labor, and in addition thereto enlarges the list of casualties each year.

In addition to this, Mr. President and gentlemen of the Institute, I had intended to take up the subject of the casualties that had occurred in the adjoining States. All our sister States have had some serious accidents from explosions or otherwise during the year, but fortunately Ohio has been left out of the list, and on this I intend to dwell at some length on the Rich Hill, Missouri, calamity which occurred on March 29th, last, and the accident recently occurring in Kansas, at Pittsburgh. The Rich Hill, Missouri, disaster as reported by the examining committee and by the experts that were selected for that purpose, report that the accident was undoubtedly the cause of over-charging with powder. I believe it further sets forth that they mined their coal on the plan of shooting off the solid, and that the current of air being feeble, the mine is one which generates fire damp, and from scientific experiments it has been demonstrated that two per cent. of fire damp mixed with coal or slack is highly explosive. Their theory is this: That the shooting occurring at one time, or nearly so, and the enormous charges of powder, that the concussion set in motion a large volume of slack or coal dust which was highly charged with fire damp which it had absorbed, and that with it was mixed a great volume of partially consumed powder and coming in contact with the flame of the shot just discharged, exploded, causing the first explosion, and that that explosion produced an increased quantity of the same explosive element which in its course came in contact with another shot exploding in the same

manner, which caused the second explosion, which was so much worse than the first; and in support of that one of their arguments was that four or five days after the accident the mules that were in the mine were found in good condition. They were loose, and had access to plenty of grain and water and were in good condition and unharmed. Had the explosion been of fire damp, the after-damp following would certainly have suffocated the mules. The reports from the Pittsburgh disaster seem to be of a similar character, and I have no doubt from what I have read on the subject that the recent disaster at Pittsburgh, Kansas, was caused in precisely the same manner. This might occur in Ohio under similar circumstances. There are places in Ohio where this thing might occur. There were two instances or more during the seven or eight months that I have been looking after this matter in which the column of air was insufficient and where the mining was done in substantially this manner, and fearing an accident of that kind I instructed two of my inspectors to visit the place and give it their personal attention, and while they were making the necessary improvements to obviate this sluggish current of air, to establish the rule that either the firing must be done at a specified time, and that when the miners were ready they must fire in rotation, but if that could not be accomplished, that one man must be selected to do the firing, and that he must commence at the shot nearest the outcast and prosecute it in against the current until he had reached the entire limit. The term we use is firing against the air. I have every reason to believe that was followed out. At least the principle is what I intended to embody in the further consideration of this report, and I am thoroughly convinced that had that practice been followed at Rich Hill, in Missouri, or Pittsburgh, Kansas, and a good many other instances, that many of these terrible casualties would have been obviated, and I am thoroughly convinced that at Rich Hill, Missouri, and Pittsburgh, Kansas, they would certainly never have occurred if they had followed this practice of firing against the air. I thank you, gentlemen, for your attention.

DISCUSSION OF MR. HASELTINE'S PAPER.

The Chair: The paper is open for discussion.

Mr. Roy: Mr. President, in order to give the matter a start I will say a few words about these explosions. I have been at Rich Hill, Missouri. I went all through the Pocahontas mine, where that explosion occurred, five years ago. I have been at the mine where this recent explosion occurred in Colorado. I have not been at Pittsburgh, Kansas, where this explosion occurred, but I have letters from the Superintendent of the mine and from

the General Manager, in which they give their views of the explosion. The Superintendent says it was due altogether to coal dust and miner's powder. Now, so far as the Pocahontas mine was concerned, I believe that was largely due to coal dust. I never saw a mine in my life where so much coal dust is made as in the Pocahontas mine. The coal is semi-bituminous and looks very much like the coal of the Clear Field region in Pennsylvania, but much softer. You can take it in your hand and crush it right up into dust. In fact, in the rooms that are worked out you raised a great cloud of dust that rose to your knees. The mine, at the time that explosion occurred, was full of that dust. Since then they wet the dust and there has not been any explosion. Now, I do not believe that the Colorado mine, or Rich Hill mine in Missouri, or Kansas mine, coal dust had anything whatever to do with the explosion, for the reason that there is not sufficient coal dust in the mines. There are mines that are dry in which there is no coal dust to speak of, and where there is no coal dust there can be no coal dust explosion. Miners who have worked in the mines of South Wales and in the northern counties of England, and also in the midland counties, know that there are some very dusty mines there, and those explosions that have been so terrific have been largely due to coal dust. That is generally admitted now by all the mining engineers of England. But it will not do to attribute every explosion to coal dust. There is not a mine in Ohio so dusty as to cause an explosion; there has to be some other theory to account for these explosions. The Superintendent of the Pittsburgh mine, in Kansas, says: Some one fired a shot; it raised a cloud of dust that took fire and this fire caught the powder in the kegs and this was the explosion. This is a convenient explanation, but, I fear, is not a correct one. The Colorado explosion resulted from a driver setting brattice cloth on fire with his naked lights, the cloth set the pillars on fire and the gases from the burning pillars produced the explosion. Coal dust had absolutely nothing to do with the matter. Now in regard to these accidents that occur in the mines of Ohio on Monday, this is a new subject. Whether there is anything in the mine being laid off on Sunday that caused more accidents on Monday, I am not able to say. Perhaps the next report will show that there are more accidents on Thursday, and the next one on Friday. But if not, and it shows that a great many of them, as much as fifty or sixty per cent. occur on Monday, then there is some reason for it. But it ought to be admitted by the members of this institute, and by every one, who has the well being of the miners at heart, that as a general rule, no accident occurs through the miners' own carelessness. Mining is a dangerous occupation, and no man is going to run into death unless there are reasons for it. If a miner should take the necessary precautions to insure absolute

safety, he would not get half a ton out. The miner must take risks or he will not get his work done. If the miner should stay back and wait until every thing was safe, or when mining, would get up and sound his coal or his roof, and sit down to study whether it was safe or not, and take no risks at all, his pay account would be very small. Some men are more careless than others it is true, but you might just as well say, that a man shot in a battle by a musket ball or a cannon ball lost his life by being too careless by being in the way of that ball, as to say that a miner is hurt by his own carelessness. He is killed in the line of duty. His is a dangerous occupation and he has got to run these risks. And taking every thing into consideration, these accidents will occur more or less, as mining is now done. I feel about as much like blaming the Almighty as to blaming the miners.

Mr. Howells: There is part of that report where it refers to the Massillon district, as having more accidents than any other part of the State, that seems to be something of a reflection upon myself and Brother Bell. But the report goes into the facts and states the cause to a great extent and that is, that more powder is used in the Massillon district for the production of a ton of coal than any other place in the United States, or the whole world. At least I will say this, as far as my knowledge goes, there is an enormous amount of powder used in the Massillon district. I presume it will average a pound of powder to every ton; a keg of powder for every twenty-five tons of coal. It is not because it ought to take that much. Of course it differs a good deal, but if a miner can not produce any place from thirty-three to forty tons to the keg, I will say that he is not a practical miner. But in blasting or shooting on the solid it will certainly take with the best miners about one keg for forty tons. There is one thing in the paper Mr. Haseltine referred to, and that it is not necessary to learn how to be a miner except to learn how to punch a hole in the coal, and understand how to put powder in a cartridge about the size of your wrist, and about three or four feet long. It would scare almost any one; it scares me; and then probably give it a tamp or two and shoot the coal off, and that that practice is brought into use by inexperienced miners. I beg to differ right there with the paper that was read. It was not by the inexperienced miners that it was brought into use, but by the experienced miners themselves, which is, to their sorrow, like the killing of the goose with the golden egg. It would be much better for the coal miners of Ohio if they had not done so—that is, for the practical miners. It is a well known fact to-day, that if you go into a coal mine where they use powder so generally, that you cannot produce ten men, probably, out of a hundred, that can properly drive an entry. I have a mine with 120 men to-day, and it is with the greatest trouble that you can find a man in there who can drive an

entry anywhere near straight, and you have to watch them day after day. They have got into the habit of shooting so much, and doing so little with the pick, that they do not try to do so; they cannot do it. The practice of shooting in that valley commenced with the old miners themselves during the war. They done so, and, of course, a miner can be made, as Mr. Haseltine's paper says, in about two or three months, so that the great majority of miners in the Massillon district to-day are inexperienced miners—rather butchers than practical miners. But I want to say, that the practice of shooting was not introduced by these inexperienced miners, but by old miners. Another thing regarding this Sunday matter—or another thing in the paper that Mr. Haseltine mentioned in regard to blasting: There are two things in the way of getting one man to blast the entire shots; that is impracticable. You have a hundred rooms in your mine, we will say. It would take that one man a long time to go around and blast all those shots. The practice in that district is, that inside of fifteen minutes from the time shooting begins, they are all gone out. At half-past four, at the tap of the drum, they begin, and in less than fifteen minutes 150 shots, or whatever the number is, have gone off; so it is not necessary to have anything new so far as that is concerned. That is the only way that can be done, and I think much better than can be done by one man. In regard to more accidents happening on Monday, I coincide with Mr. Haseltine in that matter. They shoot on Saturday evening, and the rooms are left standing over Sunday. You might say that eighty per cent. of the miners to-day do not understand, or have the proper knowledge of how much powder is necessary to put into a shot to knock down that butt of coal. Consequently, in some cases, they put in too much powder, and in others not enough, and, of course, there is a standing shot. Monday morning each man is anxious to keep his turn—because a miner that cannot keep his turn is, of course, not much of a miner—and they go to work the first thing to fill a car. Now, as Mr. Roy says, men do not go to death of their own accord; that is so; but they are so habituated to it that they do not see the danger. For instance, I go down to the railroad, and I see a train coming, and I attempt to get on that train, and miss my hold and get under the wheels. Is not that carelessness? I jump off a train when running twenty miles an hour; is not that carelessness? It is just the same with the miner. He gets so habituated to it that he does not see the danger that Mr. Roy or myself or somebody else going in there would see. Here is a prop that is knocked out by the shot, he will not see that; he is anxious to fill his turn. Perhaps after a while the weight on that brings it down and hurts him. On the other hand, he has a standing shot and he goes to work and undermines that. That is the only time a miner undermines in our

district. Now, his partner will have his hand on that chunk of coal while he undermines it, and the first things he knows, perhaps there is a very little bit of coal there holding that up, and down it comes and this one jumps back, but the one who is undermining catches it. So it seems to me that the majority of the accidents come from the real carelessness of the miners, and also from the inexperienced men that are in the mines that are not practical miners. Now then how are you going to obviate it? You can not do it. There is only one thing that could be done, and that is with the old miners themselves. Of course they pass almost any kind of a law to suit them, and they could pass this law also or rule to go by, if they wished to, and that is that no miner should mine coal in a mine that would use more than one keg of powder for fifty tons of coal. If they would pass such a rule as that, a great many of the accidents would not happen. Will they do that? No, because the powder does the work and relieves them of the muscle. Now, if we go into a mine about two o'clock, in every room you come to you will see the miners sitting down and along the road with their cartridges filled with powder. What are they doing? Just waiting to put that shot off. At the same time if they would put their muscle to work a little, instead of using one pound of powder to one ton of coal, they could produce two tons of coal with one pound of powder. So really I must differ with my friend Roy. I actually and candidly believe that the majority of accidents that happen from the falling of coal and from the falling of slate in the Massillon district, are caused through the carelessness or inexperience of the men who work there. Now, I think Mr. Roy and myself and every one who is acquainted in the Massillon coal field, will admit that there is no vein of coal that has got a better roof, or more safe roof than that over that vein of coal; at least I have never seen it. When in time of mining coal, when we did not know much about the use of powder but something about the use of the pick, about the time that Mr. Roy was working too, there were very few accidents. We could not have an accident unless a man would strike a pick into his own head. I have gone into a mine and said, why do you not put a prop here? O, I will fix that before I go out, they answer. Well, now it is enough to make a saint swear to see men working under that condition, and you would almost have to force them to do what they ought to do without saying a word. You may ask, why do not the operator or mine inspector see that they do it? Well, if you did that you would have to get a boss for every room, or the State would have to get an inspector for every room, because they will not do it. They do not see the danger, and they overlook it. Of course it is not intentional, but we must say that it is carelessness. I cannot account for it in any other way. I have one miner that I have known to go in on Sunday to

see that his room is safe, but he is the only one of the 300 or 350 that I have ever known to go in on Sunday to see that the room is safe. He is an Old Country miner, and on going into his room any man who knows anything about mining would say, that man understands mining. You cannot in 100 men to-day, in any mine in the Massillon district, find ten that are competent to drive an entry straight.

Mr. Bell: It seems, according to the remarks, that a little bit of this reflection falls upon me; but I do not take it. The fact of the matter is that you will find that less accidents have taken place in my district than any district in the State, but in that county we have a large number of accidents. I can feel for these parties as well as any one, especially when a death takes place, because I have gone through the mill myself. I have had a son mashed to pieces, and for that reason I can feel for my neighbors. Last May I picked up the *Labor Reformer* and *Labor Tribune*, of Pittsburgh, and looked in the Ohio column, and there was a short article in it in relation to the accidents that were taking place throughout the State, and partly casting reflections on the inspectors. I cut it out and placed it in my pocket-book and thought I would save it until such time as I could see some of the officers. A week or two afterward I met Mr. McBride, the President of the Miner's Association of the State, and I said, "John, is that your's?" and he said, "Yes." I said, "Where are these accidents?" Well," he said, "Ben, they are down in the the southern part of the State." He says, "One day about two weeks back there were three men buried in one village." The first serious accident that I had in my district was on the 29th of May; that was in Medina county. There was no carelessness on the part of the man that was killed, because I examined the place. In 1887, I had eight counties under my charge, and I lost nine men in those eight counties. At the present time, I have seven counties under my charge, and I have lost eight men. In 1887, all those nine men were killed in the face of the rooms, and some of them not two feet away from the face, others a yard or two, etc. This year, as I said, I lost eight men and only four of these men have been killed in the face of the rooms. Seven out of these eight were killed in Stark county and one in Medina. I had two men killed crossing the bottom of the shaft when the cage was in motion. That was carelessness; no man has a right to do that, and no inspector and no boss can prevent that. One of those men was standing along side of the boss talking to him about some business, and he slipped from the side of the boss, and was walking across the shaft, when the cage came down on him. It was carelessness on his part. Another death I had, if the poor fellow had lived, he would have made his mark in the world as a mining expert, and would have taken charge of the mine that he was

killed at. He was killed by being accidentally thrown down a shaft, which he was fixing, a distance of 135 feet. By and by at the very same shaft a young man on the road, out of work, from the neighborhood of Coshocton, came to the mine and seemed to be very curious to look down the shaft; he was told not to go near the shaft, and still his curiosity got the best of him, and he watched when no one was there and went to the side of the shaft. The shaft was fenced off, and while the cage was coming down, he laid down and pushed his head through the rail, and the cage was in motion, and came down and took off the top of his head. Now, that in my opinion, and I am sorry to say it, is a case of suicide, and I have a right to my opinion. The other four were killed in the face of the rooms, and three of the four deaths were at one mine, and that mine never shipped one ton of coal; it was a new shaft. One of them was killed with a stone falling, another one with the cage coming down on him. I was glad to hear Mr. Roy's paper last night, on trying to form some plan of getting a hospital for the benefit of the miners. I think there should be something of the kind, and I think the miners would support it themselves. But I think, if we should go to work in the first place, and try to prevent these accidents, it would be a great deal better thing. Now I say, and say it boldly here, that the majority of our accidents in the banks are either carelessness, or the men are not miners; but Mr. McBride said it was the practical miners, the best miners in the State that are killed. How can that be? All through the Massillon district, they blast it off the solid, and the strength of the powder knocks out the props and the next morning they are in a hurry to get a car full, and the first thing we know some of them are killed. Now, is there a remedy for that? It is not about the present, but can we stop it for the time to come? Now I have spoken to some men since I saw some of the reports in our papers, and I spoke to some of them last week. "Suppose you were compelled to bear this coal in, what would you do it for?" "God, I would not do it for \$1.50 a ton." Can any of these operators pay that price for it? As long as we blast coal off the solid we will have accidents, because I have been in the rooms where the props have been blown out ten or fifteen and as far as twenty yards back from the face, and when I have stopped the cars from going in at all until the props were put up, I have been cursed for it.

A member: By the miners or boss?

Mr. Bell: The miners. I can curse myself. I am not like Mr. Roy; he says he can not swear, but I can. It is deplorable to see the accidents we have in this State, and I would like to see some remedy.

The Chair: Right in that connection it might be well to have Mr. Brooks' paper on "Experiments in Blasting."